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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,524

02/24/2005

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EXAMINER

ALAM, RASHID A

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/525,524	<b>Applicant(s)</b> USHIDA ET AL.	
	<b>Examiner</b> RASHID ALAM	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5,9,17,19,21-23 and 32-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5,9,17,19,21-23 and 32-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. The applicant's request for reconsideration filed on 04/27/2009 was received. Claims 5 and 9 are amended. Claims 1, 4, 7, 10, 12, 14-16, and 31 are cancelled. New claims 33 and 34 are added.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5, 9, 17, 19, 21, 23, and 32, are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozawa (US 2002/0058186) in view of Kanda (US 2002/0086224).

Regarding claims 5, 9, and 32, Nozawa teaches a multilayer mask blank having a light translucent film on the surface of the substrate such that all layers contain different amounts of nitrogen in which the surface layer, one layer having more nitrogen than the other, which is the light translucent film, which also serves as the ammonium ion production preventive layer and is exposed on the surface of the mask after the mask is manufactured (see abstract and page 4, paragraph 0050 and paragraph 0075). The light translucent film on the surface of the substrate contains different amounts of nitrogen and oxygen, one layer having more nitrogen than the other, which serves as the ammonium ion production preventive layer (see abstract and page 4, paragraph

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0050 and paragraph 0075). Nozawa teaches a mask blank having a light translucent film on the surface of the substrate that contains nitrogen which serves as the ammonium ion production preventive layer and is exposed on the surface of the mask after the mask is manufactured (see abstract and page 4, paragraph 0050). Nozawa also teaches forming a pattern on the substrate (see page 2, paragraphs 0023 and 0024). Nozawa teaches a multilayer mask blank having a light translucent film on the surface of the substrate such that all layers contain different amounts of nitrogen in which the surface layer, which is the light translucent film, serves as the ammonium ion production preventive layer and is exposed on the surface of the mask after the mask is manufactured (see abstract and page 4, paragraph 0050 and paragraph 0075).

Nozawa also teaches a multi layered phase shift mask blank having a light translucent film or a light translucent portion having the designated phase angle and transmittance and having a translucent film on a transparent substrate, comprising of nitrogen, metal, and silicon as a main component on said transparent substrate (see abstract). Nozawa teaches the translucent film on the surface of the substrate that contains nitrogen also contains silicon (see abstract). However, Nozawa is silent about the oxidation of the surface of the wafer.

Kanda teaches a mask manufacturing method in which the surface of a wafer is oxidized to form a layer or film on the wafer (see paragraph 0077 and figures 8 and 9). Therefore, it would have been obvious to one skilled in the art at the time of the invention to oxidize the surface of a substrate or wafer to produce an ammonium ion production prevention layer by Nozawa, because Kanda teaches a mask manufacturing

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method in which the surface of a wafer is oxidized to form a layer or film on the wafer in order to effectively prevent or decrease deterioration of image quality (quality of a circuit pattern image) based on a dustproof transparent member and/or circuit pattern writing errors.

Regarding claim 17, the ammonium ion production preventive layer (light translucent film) thickness is from 672 angstroms (see table 1, entry 1) and the thin film, which contains nitrogen, has thickness of 935 angstroms (see page 5, paragraph 0094).

Regarding claim 19, the chemical composition of the ammonium ion production preventive layer (light translucent film) is made up of stable elements (see page 6, paragraph 0096).

Regarding claim 21, the thin film contains silicon and molybdenum (see page 5, paragraph 0094) and the ammonium ion production preventive layer (light translucent film) is oxidized (see page 6, paragraph 0096).

Regarding claim 23, the exposure light source is a KrF laser and an ArF laser (see page 4, paragraph 0051).

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nozawa (US 2002/0058186) and Kanda (US 2002/0086224) as applied to claims 5, 9, 17, 19, 21, 23, and 32 above, and in view of Ohshima (2002/0142249).

Regarding claim 22, Nozawa and Kanda teach as stated above in paragraph 5. However, Nozawa and Kanda are silent on the concentration of ammonium.

Ohshima teaches the concentration of ammonium ion is from 0 to 10,000 ppm, which is less than 20 nanograms per centimeter squared (see page 25, paragraph 0219). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for the concentration of ammonium ion to be less than 20 nanograms per centimeter squared by Nozawa, because Ohshima teaches the concentration of ammonium ions being less than 20 nanograms per centimeter to accommodate anodization treatment of a lithographic printing plate.

5. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozawa (US 2002/0058186) and Kanda (US 2002/0086224) as applied to claims 5, 9, 17, 19, 21, 23, and 32 above, and in view of Rolson (US 5,851,701).

Regarding claims 33 and 34, Nozawa and Kanda teach as stated above. However, Nozawa and Kanda are silent about the thickness of the prevention layer being 100 angstroms or less.

Rolson teaches a layer on a photomask that contains molybdenum and nitrogen that is 100 angstroms or less (see column 4:58 to column 5:7). Therefore, it would have been obvious to have a mask with an ammonium ion production preventing layer by Nozawa and Kanda, because Rolson teaches a layer on a photomask that contains molybdenum and nitrogen that is 100 angstroms or less that provides an increased intensity at the target and eliminates the need to align a separate diffraction grating with the primary mask.

***Response to Arguments***

Applicant's arguments filed 04/27/2009 have been fully considered but they are not persuasive. The applicant argues that the reference of Nozowa presented in the office action dated 10/28/2008 does not teach the claimed invention. Specifically, the applicant argues that the halftone phase shift mask blank of the instant invention contains a thin film that is labeled the "ammonium ion production preventing layer" for preventing the production of ammonium ions because it contains less nitrogen content relative to said light transmissive film other than the surface portion and the references of Nozawa and Oshima fail to teach the "ammonium ion production preventing layer", specifically the preventing of ammonium ions or no mention of ammonium ions at all. Furthermore, the applicant argues that the references of Nozawa and Oshima are not analogous art.

In response to applicant's argument that the prior art fails to teach the ammonium ion production preventing layer that prevents the production of ammonium ions because it contains less nitrogen content relative to said light transmissive film other than the surface portion, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In response to the applicants argument that Nozawa and Oshima are not analogous art, the examiner contends that the references teach all of the materials and aspects of the present invention, and they are in the field of photolithography. Nozawa teaches a phase shift

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mask enabling to improve resolution of transcription pattern by applying phase difference between exposure lights permeating a mask and Oshima teaches negative photosensitive lithographic printing plate which comprises of a photosensitive layer which is in the field of radiation imagery chemistry which deals with imaging affecting physical property of radiation sensitive materials. Furthermore, the reference of Kanda has been added to remedy the added claim limitations in independent claims 5 and 9. With respect to the new dependent claims 33 and 34, the reference of Rolson is added to meet the claim limitations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RASHID ALAM whose telephone number is (571)270-3959. The examiner can normally be reached on Mon.-Fri. 7:30 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/  
Supervisory Patent Examiner, Art Unit 1795

/RASHID ALAM/  
Examiner, Art Unit 1795